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CERTIFICATION OF ATTACHED ENGLISH TRANSLATION OF PCT
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I hereby certify the English translation attached is a true and accurate copy of the
referenced PCT/EP2003/013041 application.



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DOMESTIC APPLIANCE AND SWITCH FOR APPLICATION IN A
DOMESTIC APPLIANCE

The invention relates to a domestic appliance with a
5 door mounted to pivot on a horizontal axis and a switch
for use in such a domestic appliance.

Dishwashing machines or cookers provided with a door
which is arranged in such a way that it is pivotable
10 around the horizontal axis thereof and which is opened
for loading and unloading are known. This pivotally
mounted door is usually embodied in a dishwashing
machine such that it is opened so far for loading and
unloading that the inner side of the door facing the
15 treatment compartment, the washing container, is
aligned substantially horizontally so that a lower
crookery basket can be received. For this purpose the
lower crookery basket advantageously has rollers or
wheel devices on its underside which are guided over
20 special rails or beads in the inside of the door. After
the door has been completely opened out, i.e., until
the door is aligned substantially horizontally and the
lower crookery basket has rolled out, this can be
loaded and unloaded relatively conveniently. Such a
25 widely opened door represents a potential hazard,
especially if a dishwashing machine thus opened is
located in a dark room, for example a kitchen.

DE 198 04 894 A1 discloses a switch which can be used
30 in domestic appliances, for example in dishwashing
machines and can be arranged on the domestic appliance
such that when the door is open, a light source is
switched on in the interior of the domestic appliance
and goes out again when the door closes. A trip cam
35 associated with a spring element is provided to actuate

the switch and the switch has a control stem which is actuated by the spring element. This switch can only distinguish between the two states "door closed" and "door open". It is disadvantageous that an intermediate
5 state such as, for example "door slightly open" is not identified. However, it would be desirable to identify this intermediate state in front-loading dishwashing machines to comply with the different habits of the user and also with the wish to indicate a potential
10 hazard.

It is the object of the invention to provide a domestic appliance of the type specified initially which represents no increased potential hazard even when the
15 door is opened wide and to provide a switch which also "recognises" intermediate states of the door position.

This object is solved by the domestic appliance according to the invention having the features of claim
20 1 and by a switch according to the invention having the features of the further independent claim. Advantageous embodiments of the invention are characterised in the dependent claims.

25 The inventive arrangement of the domestic appliance according to the invention provided with a door which is arranged in such a way that it is pivotable around the horizontal axis thereof, has a switch arranged on the door and is embodied in such a way that it switches
30 on a light source in the interior of the domestic appliance when a certain pivoting angle of the opened door is reached.

The switch according to the invention has a retractable
35 button which is actuated by means of a weight which is

always self-aligning with the vertical. From a certain inclination of the door said switches closes a circuit to switch on a light source in the interior of the domestic appliance.

5 During daily use of a household appliance provided with a door which is arranged in such a way that it is pivotable around the horizontal axis thereof, said appliance is used differently according to the personal
10 habits of the user. Whereas some users always keep the pivotally mounted door closed and merely open it for loading and unloading, other people only lock the pivotally mounted door during the program run and leave the door ajar and unlocked for the rest of the time.
15 Even if the mechanical locking installation and the door seals of present-day household appliances are designed for lifetime usage, some people avoid continuously locking the door if no program is running. Another reason for not locking can be that the door can
20 be opened more quickly for loading if it is not locked. Another reason for not locking may be that odours can escape. Also moisture can easily escape from the interior of the household appliance without the door being pivoted out so far that it represents a potential
25 hazard.

With the switch according to the invention in a domestic appliance provided with a door which is arranged in such a way that it is pivotable around the
30 horizontal axis thereof, it is possible to switch on a light source in the interior of the domestic appliance which illuminates the interior of said domestic appliance only when a certain pivoting angle of the opened door is reached. Thus, with the switch according
35 to the invention it is also possible to leave the door

ajar and unlocked, according to the personal habits of the user, without a light source being switched on.

A domestic appliance according to the invention fitted
5 with the switch according to the invention thus has the advantage that a light source is always switched on when the door is pivoted out so far that it can be a potential hazard but no light is switched on if the pivoting angle of the door is small. Another advantage
10 of the present invention is that the user of the domestic appliance, when entering the unlit kitchen carrying items to be placed in the domestic appliance for example, need not switch on the room light expressly for this purpose for loading the domestic
15 appliance but merely after putting down the items and opening the domestic appliance, has sufficient light to be able to load the domestic appliance.

In an advantageous embodiment of the switch according
20 to the invention a strip-like bar is arranged over the retractable button such that from an inclination which can be determined, the weight provided at its end presses down the retractable button as a result of gravity and thus closes a circuit which switches on a
25 light source. If the pivot angle of the opened door is reduced, the reaction force of the strip-like bar on the button exposed to spring pressure is reduced accordingly. As soon as the spring pressure in the button is greater than the reaction force of the strip-
30 like bar, the spring presses the button away from the contact point and the circuit to the light source is interrupted. The angle of inclination from which the switch function is triggered can be calculated from simple physical relationships whose calculation
35 parameters are the spring strength in the button, the

mass of the weight and the geometrical profile of the connecting means. The angle of inclination can be adjusted by varying these quantities.

5 According to an advantageous embodiment of the invention, an unstably shaped connecting means is guided through an eye-like recess in the retractable button, said means having a weight provided at its end which presses down the retractable button as a result
10 of gravity. In this case, the unstably shaped connecting means can be a wire and/or plastic.

The invention provides a domestic appliance with a door mounted to pivot on a horizontal axis which presents no
15 increased potential hazard even when the door is wide open and also provides a switch which "recognises" intermediate states of the door position.

The invention is explained subsequently with reference
20 to a preferred embodiment shown in the drawings. In the figures:

Figure 1 is a domestic appliance according to the invention with the door pivoted out
25 horizontally;

Figure 2 is a domestic appliance according to the invention with the door unlocked and ajar;

Figure 3 is a schematic diagram of the switch
30 according to the invention in a first position and

Figure 4 is a schematic diagram of the switch
35 according to the invention in a second position.

Figure 1 shows a domestic appliance according to the invention, in this exemplary embodiment a dishwashing machine 1, where a crockery basket 3 is arranged on its door 2 which is mounted in such a way that it is pivotable about a horizontal axis not shown. In this state a switch 4 is activated and has switched on a light source 5 arranged in the interior 6 of the dishwashing machine 1. The switch 4 can be connected to a control unit 7 which for its part is connected to the light source 5 and controls its state. The control unit 7 is more appropriately connected to an electronic program control, in the exemplary embodiment shown, a program controller connected to the dishwashing machine 1.

Figure 2 shows the dishwashing machine 1 with its pivotable door 2 inclined such that the switch 4 is not activated. In this position steam can easily escape from the interior of the dishwashing machine without the door 2 being pivoted out so far, however, that it represents a potential hazard.

Figure 3 shows a schematic diagram of the switch 4 according to the invention comprising a button 8 which is pre-stressed by means of a spring 11. In this first position the weight 10 is suspended on an unstably shaped connecting means 9, for example a wire or plastic strip. The connecting means can also be embodied as stably shaped in which case, however, the relative movement of the connecting means with respect to the button must be taken into account. As a result of gravity, the weight 10 exerts a certain force on the button 8 but in this state the spring force is greater and the switch 4 stays in the "off" position.

Figure 4 shows a schematic diagram of the switch 4 according to the invention where the weight 10 presses down the button 8 by means of the unstably shaped connecting means 9 and thus closes a circuit. As a result of the inclination of the door, the force component of the connecting means 9 on the button 8 is increased so that the reaction force is now greater than the spring force and the switch 4 goes over to the "on" position.

The pivot angle is determined at the factory so that the switch 4 located in the door only comes on when the deflection is more than 10° , for example. However, it may also be appropriate to switch on the switch 4 at a smaller pivot angle.

The switch 4 is advantageously arranged in the door 2 so that no sealing problems with respect to the washing container are to be expected.

In a further embodiment of the present invention which is not shown, it is advantageous, in addition to switching on the light source 5, to generate an acoustic signal which sounds after the pivotally mounted door 2 has remained open for a certain time, for example after 30 minutes, as a reminder that the door 2 is open.

With the switch 4 according to the invention in a domestic appliance with a door 2 mounted to pivot on a horizontal axis, it is possible for a light source 5 to be switched on in the interior 6 of the domestic appliance, which illuminates the interior of the domestic appliance, only when a certain pivoting angle

of the opened door is reached. Thus, with the domestic appliance it is also possible to leave the door 2 ajar, according to the personal habits of the user, without a light source 5 being switched on.

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A domestic appliance according to the invention fitted with the switch 4 according to the invention thus has the advantage that a light source 5 is always switched on when the door 2 is pivoted out so far that it can represent a potential source of danger but when the pivoting angle of the door 2 is small, no light is switched on. Also the user of the domestic appliance, when entering the unlit kitchen carrying items to be placed in the domestic appliance for example, need not switch on the room light expressly for this purpose for loading the domestic appliance but merely after putting down the items and opening the domestic appliance, has sufficient light to be able to load the household domestic.

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The invention provides a domestic appliance provided with a door 2 which is arranged in such a way that it is pivotable around a horizontal axis thereof, which also presents no increased potential hazard when the door is wide open, and further provides a switch 4 which also "recognises" intermediate states of the door position.